"Chemicals in Drinking Water" Lab Name__**Example Key**_____period__

Materials

- "Drinking water" solutions in a 1,000 ml beaker
- Empty 250 ml beaker
- Burners or hot plates
- Ring stands if using burners
- Matches if using burners
- Tongs
- Hot pads
- Scale
- Calculator
- Safety goggles

Procedure

1. Using a graduated cylinder, collect 100 ml of "drinking water" from one of the 1,000 ml beakers. Record the type of contaminant in your water in Table 1.
2. Collect a 250-ml beaker and measure its mass using a scale. Record its mass in Table 1.
3. Carefully pour all of the drinking water into the empty beaker. Be careful not to spill.
4. Place the beaker with the drinking water on the hot plate or ring stand.
5. Turn the hot plate control knob to the setting provided by your teacher. If using a burner and ring stand, light your burner and set the flame to the level your teacher shows you.
6. Allow the water to come to a light boil. DO NOT allow your water to boil vigorously as you will loose some of your contaminant to splattering.
7. Begin working on questions 1, 2, 7, 8, and Extra Credit while monitoring your solution.
8. When your water is completely boiled off, turn off your hot plate or burner.
9. Using a hot pad or tongs, carefully move your beaker to the lab table to cool.
10. Place the beaker on the scale and record the mass of the beaker and contaminant in Table 1.
11. Calculate the mass of the contaminant and record the amount in Table 1.
12. Calculate the concentration of your contaminant and record the results in mg/L in Table 1.
13. **SHOW YOUR WORK** to the right of Table 1.

Table 1

Contaminant	*Chromium (Cr)*
Mass of empty 250-ml beaker in **g**	100 g
Mass of beaker and Contaminant in **g**	100.42 g
Mass of the contaminant **in mg (pay attention to units)**	420 mg
Volume of drinking water in **L**	**0.1 L**
Concentration of the	4200 mg/L

Contaminant in **mg/L**	

Questions

1. What was your contaminant? ____Chromium_____

2. Check the EPA Drinking Water Standards and record the Maximum Contaminant Level (MCL) for your contaminant.

____0.1 mg/L_____

3. What was the concentration of your contaminant in your drinking water? _4200____mg/L

4. Does this concentration exceed EPA Drinking Water Standards? **YES** or NO

5. If your concentration is above the MCL, by how much is the MCL exceeded? __4199.9_mg/L

6. Look at the amount of contaminant in your beaker and compare that with the mass. Now consider the MCL for your contaminant. What does this tell you about the EPA Drinking Water Standards?

The amount of contaminant left in the beaker appeared to be very small. It looked like a residue or film. Since the contaminant in out water was 420,000 times the MCL, it is obvious that the Drinking Water Standards are very strict. They do not allow for much contamination at all.

7. What are the health effects of your contaminant?

If the MCL for chromium in my drinking water was exceeded for many years, I could develop allergic dermatitis, according to the National Primary Drinking Water Regulations.

8. What are some of the sources of your contaminant? (Where does is come from?)

Chromium is found in natural deposits as well as discharge from steel and pulp mills.

Extra Credit

How can drinking water be treated to remove this contaminant? Cite your source.
Activated carbon, ion exchange, and reverse osmosis may be used to treat and remove chromium from drinking water.
http://www.cce.cornell.edu/factsheets/wq-fact-sheets/fact4.htm
http://www.ext.nodak.edu/extpubs/h2oqual/watsys/ae1029w.htm#what